

## Transformations of traditional land use and settlement patterns of Kosarysche Ridge (Chornohora, Western Ukraine)

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**Abstract.** The traditional character of Hutsul villages and their spatial development has been changing slowly but inevitably over the course of time. Historically, single farmsteads were built separately and were mostly self-sufficient, the distance between them being considerable. Nowadays, after the collapse of the Soviet Union, the economic transformation brought along many changes, among these the fact that depopulation is taking place and alterations in spatial development are occurring again. The localisation of secluded farmsteads, situated far away from each other is no longer as important as it used to be. Reasons for the abandonment of farmsteads were examined, and factors such as altitude, distance from the village centre and the administration affiliation were taken into account. Land use changes were analysed in relation to the slope inclination. Some of the most important factors influencing the intensity and direction of these processes are high prices of land, improvement in living conditions, better access to services and the general ‘westernisation’ of lifestyles. The depopulation rate has been seen to increase in correlation with the rising altitude and distance from the village centre. On the other hand, there was no unambiguous link between the abandonment of farmsteads and administration affiliation. Mowed areas were localised on the slopes with the smallest inclination. Animal breeding has become unprofitable due to a lack in demand and low product prices, which has led to an increasing number of meadows and pastures lying fallow.

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## 1. Introduction

Hutsulshchyna is a region located in the western Ukraine, at the confluence of the Prut, Cheremosh and Tisza Rivers and at the foot of the Gorgany and Chornohora Mountains. Before World War I, it used to be the most ethnographically heterogeneous part of Galicia (a region comprising Polish lands annexed by Austria in the late 18<sup>th</sup> century). The core of its inhabitants was constituted by the Walachian-Ruthenian Highlanders, called the Hutsuls who traditionally engaged in pastoralism and animal husbandry. They created a colourful folk culture, the manifestations of which have been preserved not only in the material and spiritual sphere, but also in the landscape of the countryside. Over the course of the centuries, the mutual interaction of man and nature has led to the creation of a unique cultural landscape, which is a mosaic of traditional construction development, pastures, mowed meadows and wildlife.

Originally, the Hutsul village was of a solitary character (Żukowski, 1935; Witkowski, 2001; Witkowski, 2006). Individual farming enclosure were scattered on the slopes, often at a considerable distance from one another. Greater agglomerations of farmsteads focused around the village centres (*osedok*), which were mostly inhabited by influx population. The farmsteads scattered among the mountains would create different-sized hamlets – the so-called *kuty* (Witkowski, 2006). The number of such settlements decreased in correlation with an increase in altitude. Farming enclosures located above 1,000m accounted for a large percentage of settlement patterns during the interwar period – up to 23% as in the case of Dzembronia (Witkowski, 2006), whereas permanent settlement in localities of the highest altitudes reached 1,300m (Mackiewiczówna, 1934). The development carried out above this limit included in general buildings of seasonal utility which were related to pastoral farming and

hay harvesting. Single farmstead settlement, which was typical of Hutsulshchyna, was of a self-generating character and it was associated with the need to reduce the distance between the place of residence and the farming areas, which were constituted by upland pastures and meadows (Witkowski, 2006). An important role was also played by the self-sufficiency of the farmsteads and the associated diminished need for external communication with the world. Another reason can be traced to the fact that some of the first settlers in the Carpathian Mountains were fugitives and highwaymen who had sought refuge in hard-to-reach and far-flung places. Therefore, settling at a considerable distance from other populated areas could have been, in fact, a safety measure (refugial type of settlement).

It is worth noting that the area of solitary settlement in the eastern Carpathians corresponded to the region where arable land accounted for less than 10% of the total area, but where pastures were in abundance (Kubijovyč, 1924). According to pre-World War II data (Męciński, 1938), meadows and pastures of the Hutsulshchyna occupied about 42% of its total area, with the arable land at a meager 3%. This lack of land cultivation was caused on the one hand by the rather unfavourable physiographic conditions, and on other hand, by the cultural factors. The significant transformation of the Hutsul village took place during World War II and in the years directly following the armed conflict. It consisted mainly in a fundamental depopulation, but also in collectivisation. In the years 1944-1951, within the framework of persecution for partisan activities and by order of the Soviet authorities, the population of western Ukraine were deported *en masse*. In turn, the period between 1948-1951 is characterised by the collectivisation of about 99% of farmsteads and arable lands in this area (Olszański, 1994).

Abandoning farming and the farmsteads, as well as the related reforestation process, are among the principal changes currently taking place in the

Carpathians (Kozak, 2003, 2010; Bezak et al., 2007; Kuemmerle et al., 2008; Sitko, Troll, 2008; Gurung et al., 2009) and other European mountain ranges (Garcia-Ruiz et al., 1996; MacDonald et al., 2000; Collantes, Pinilla, 2004; Roura-Pascual et al., 2005; Falcucci et al., 2007; Gellrich, Zimmermann, 2007; Soliva, 2007; Mladenov, 2011; Latocha, 2012; San Roman Sanz et al., 2013). However, simultaneously a reverse process of illegal logging is observed (Kuemmerle et al., 2009; Griffiths et al., 2012). These changes result from socio-economic transformations, which have been particularly rapid in the case of the countries of Central and Eastern Europe – in connection with the fall of the Iron Curtain in 1989 (Kuemmerle et al., 2008; Kozak, 2010; Baumann et al., 2011).

After the collapse of the Soviet Union in 1991, there began a period of re-privatisation of agriculture and former owners gradually repossessed their lands. However, traditional forms of settlement and farming have been undergoing numerous transformations. The recent years have seen an intensification in the process of depopulation of upland farmsteads. Elderly farmers pass away leaving the young generation to fend for themselves in harsh living conditions, which together with the difficulties of communication cause them to descend to the valleys.

As a consequence of these transformations, the function and the significance of the rural areas have altered greatly (Rey, Bachvarov, 1998; Latocha, 2012). What is particularly notable is the disappearance of the traditional cultural landscape in mountainous areas (MacDonald et al., 2000; Turnock, 2002; Palang et al., 2006; Kuemmerle et al., 2008; Reif et al., 2008; Baumann et al., 2011). An initial increase in heterogeneity of the landscape in the early stages of farmstead abandonment was followed by its uniformisation (MacDonald et al., 2000). Newly constructed houses have nothing in common with traditional buildings. New global trends lead to unification of architectural infrastructure and promote the development of monocultural schemes in agriculture and forestry. Cultural globalisation is today clearly expressed in monotonous 'cultured' landscapes (Kibych, 2010). Such changes may be also observed in the case of the modern-day Hutsul village. This phenomenon is particularly evident on the Kosarysche Ridge.

Many studies (Gellrich, Zimmermann, 2007; Latocha, 2012; Müller, et al. 2013; Pellissier et al., 2013) showed that processes of land abandonment and reforestation are kind of geo-deterministic ones. The main factors lying behind them are: elevation and slope, so the factors related to topography. Among other factors, authors mentioned: soil quality, which is another environmental factor, as well as road infrastructure and physical accessibility. Hence, also in this study the relationship between farm abandonment and these factors was analysed.

The aim of this study was to determine the current state of spatial development of the Kosarysche Ridge. The phenomenon of upland farmsteads abandonment together with the major changes in land use were analysed in search of the main causes for the observable transformations. An attempt was made towards determining how the selected factors influence the direction and the level of intensity of these changes.

## 2. Research area

The Kosarysche Ridge is a representative example of the 21<sup>st</sup> century changes in the Ukrainian Carpathians such as: depopulation, farm abandonment and decrease in the size of livestock. The Ridge is relatively small, but it constitutes an integrated part of the described region. It is located in the western part of Ukraine, in the Chornohora Range (eastern Carpathians). On the administrative level, it belongs to two villages: Bystrets and Dzembronia (Ivano-Frankivsk Oblast, Verkhovyna Raion). It is located entirely within the Carpathian National Park (Krukar, Troll, 2010).

In this paper Kosarysche (518.7 ha) is defined as the area above the anthropogenic timberline, which means the timberline lowered artificially as a consequence of human activity, inter alia animal husbandry. However, within the study area forest patches may be found. It also includes the deforested area of the mountain pass connecting Kosarysche with the main ridge of Chornohora. The boundaries run along the currents of: Dzembronia, Black Cheremosh, Bystrets, Cherlny and an unnamed tributary of Dzembronia, flowing near the hamlet of Horby. The Kosarysche Ridge is made up of layers

of Chornohora nappe dipping in the NE-SW direction, and therefore its course in the NW-SE direction determines the existence of asymmetric slopes (Krukar, 2006). The NE slopes on which the village of Bystrets is located are characterised by a much greater inclination than the SW slopes which belong to Dzembronia (Zahorecka, 1934). The inclination values of the slopes within the study area range from 0-40°, while the altitudes are between 780 to 1,148m (Krukar, Troll, 2010).

The study area lies entirely in the lower montane zone, extending from 600 to 1,200m (Kozij, 1972). However, due to the many centuries of human activity, the primary vegetation has undergone significant transformations. The timberline was lowered at the side of Bystrets to an altitude of 950m, and on the side of Dzembronia, the forest was basically cut down to the bottom of the valley, i.e. down to about 780m. For this reason, secondary meadows and mid-forest meadows called *carynki* (Nesteruk, 2001) were created in the immediate vicinity of the beech forest. The entire Kosarysche Ridge is covered with various species of grassy vegetation compounds, utilised as meadows and pastures. Among these, there are both communities of matgrass (*Nardus stricta*), resulting from overgrazing, as well as communities of tufted hair-grass (*Deschampsia caespitosa*), common bent (*Agrostis capillaris*) and that of creeping red fescue (*Festuca rubra*) (Nesteruk, 2001).

It is worth noting that even a dozen or so years ago, the study area in its entirety used to be mowed or grazed. The region of Kosarysche belonged to the *kolkhoz* in Krasnyk, which had been created within the framework of collectivisation that followed World War II. Currently, most of the plots are private property. According to the locals, privatisation did not pose much of a problem here, because the descendants of the former owners simply returned to the borders of the land from before the war.

### 3. Materials and methods

The study consisted of two main stages – field research carried out on the basis of quantitative and qualitative methods and desk quantitative analyses. As part of field studies performed over the course

of 2010, farmsteads and mowed areas were mapped using a Global Positioning System (GPS) receiver. A covert scientific observation and an in-depth interview have also been executed. The term ‘farmstead’ was applied to a complex of buildings located in close proximity to one another which were functionally linked, and among which a residential building and farm buildings could be distinguished. For each object within a farmstead a general use was determined (residential, farming), together with its structural condition (good, average, poor), and a frequency of use (permanent, seasonal, abandoned). Noted separately were also the remains of buildings and facilities under construction. The information on the current use of farms was obtained from observations of their environment, external appearance of the buildings, as well as in-depth interviews with the local population. These interviews were also a source of information on the farming practices in operation on Kosarysche, as well as the contemporary social and economic changes occurring in the region. The impact of factors such as altitude, distance from the centre of the village and administration affiliation exerted upon the location and use of different types of farmsteads underwent desk analysis together; also examined was the relationship between the location of mowed areas and the natural topography of the land – in particular its inclination. In the course of these studies, and in addition to the data obtained from field research, orthophotomaps were used (accessible via GoogleEarth) and a digital elevation model (DEM) provided by the authors of the tourist and nomenclature-defining map of Chornohora (Krukar, Troll, 2010).

In order to assess the effect of altitude on the distribution, the frequency of use and the structural condition of farmsteads, the fieldwork data were overlapped onto a hypsometric map generated on the basis of the DEM. This impact has been studied in three height ranges: below 900m, from 900 to 1,000m and above 1,000m. The analysis of the relationship between the distance from the village centre, understood by the location of orthodox church, and the location of farmsteads, their structural condition and the frequency of use was carried out within three buffers – less than 0.5km, between 0.5 and 1.5km and above 1.5km. The impact of administrative affiliation was analysed within two villages: Bystrets and Dzembronia. The relationship between

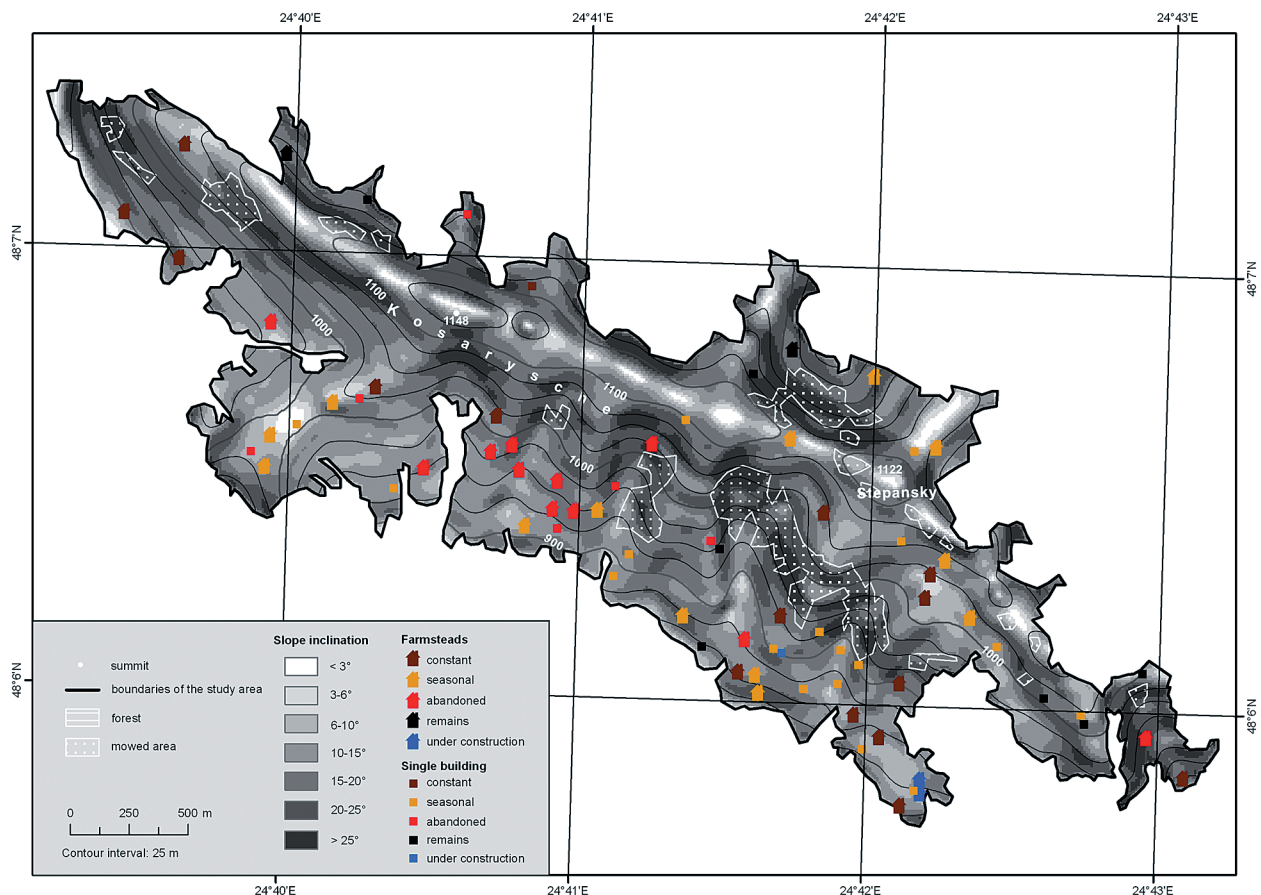


the slope inclination and meadow mowing was studied by overlapping the boundaries of mowed areas onto the slope map generated from the DEM.

#### 4. Results

In the course of field research 75 farmsteads were mapped, out of which 16 were still being used and 17 had been abandoned (Fig. 1). Most of the farmsteads – as many as 30 – were used seasonally and usually in the summer during farming works. The remaining part were once existing farmsteads and currently only visible in the form of stone foundations (9) or buildings under construction (3). In total, 217 buildings were mapped, out of which 51 were residential buildings (including 7 under construction or at its final stage) and 166 were farm

buildings. The mapped buildings represented various structural conditions. Among the residential buildings a good condition was predominant (36 objects). The number of poorly preserved (4) or dilapidated (4) constructions was much lower. In the case of farm buildings, the well-preserved ones were also in abundance (119). The numbers of buildings in a medium and poor condition were similar – respectively 24 and 23. Most abandoned farmsteads were found in the altitude range of 900–1,000m (Fig. 1). They accounted for 43% of all farmsteads in the area, while the farmsteads used regularly and seasonally accounted respectively for 14% and 28%. Below 900m (or at the closest level to the bottom of the valley), only one abandoned farmstead was observed, with farming enclosures of a seasonal utility being prevalent (50%). It is similar in the case of altitude higher than 1,000m where 45% of farming enclosures are utilised seasonally.

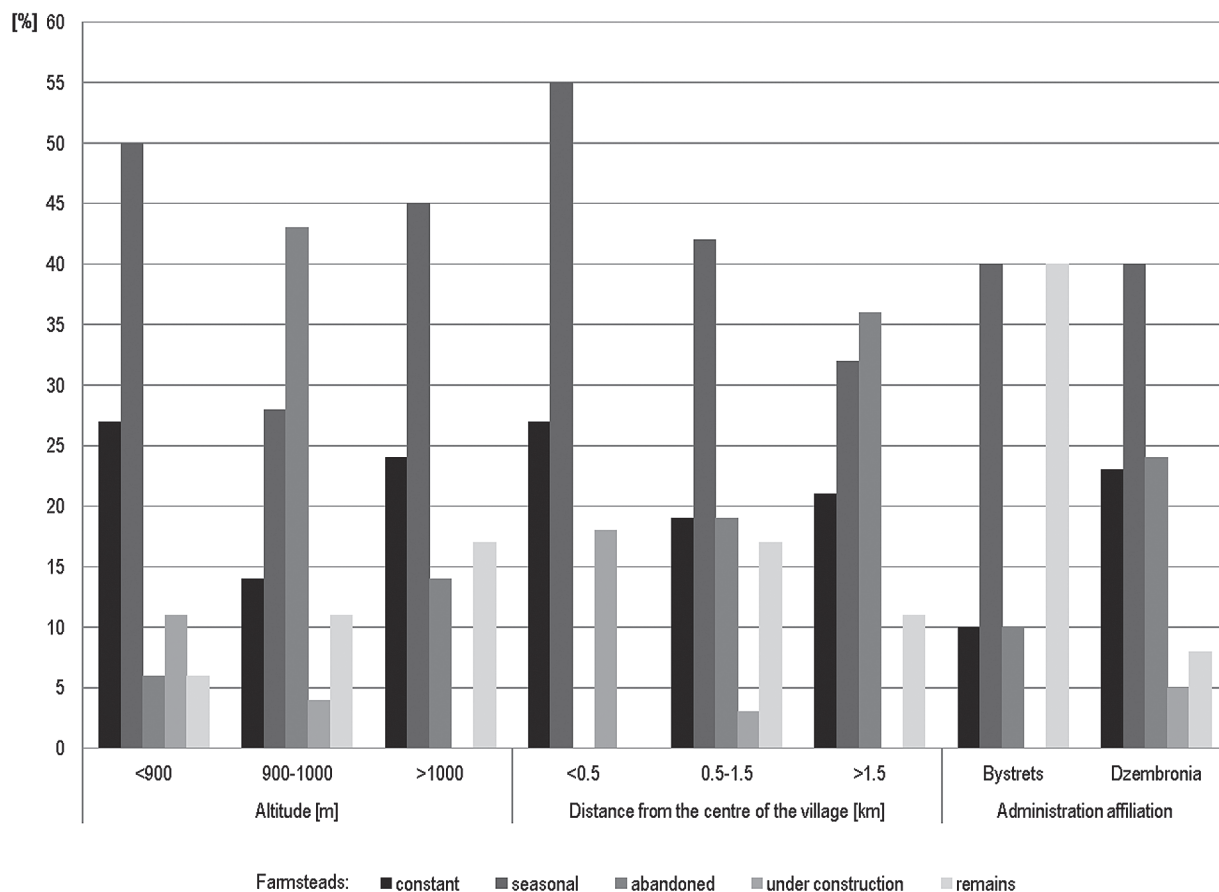


**Fig. 1.** Spatial distribution of farmsteads in the relation to slope inclination on Kosarysche Ridge (October 2010)

Source: Developed by the authors based on GoogleEarth, digital elevation model (DEM) and own research

Buildings under construction were scarce and rather typical of the lower elevation zones – up to 1,000m. In turn, most remains of the once existing

farmsteads were identified at altitudes higher than 1,000m. They accounted for 17% of all mapped objects in this altitude range.



**Fig. 2.** The farmsteads distribution and frequency of their use according to the altitude, the distance from the village centre and administrative affiliation

Source: Authors' own research

In the region of Kosarysche the height above sea level is positively correlated with the distance from the village centre, as both in the case of Dzembronia, as well as Bystrets it is located at the bottom of the valley. The areas belonging to each class of distance are not the same, although a general direction of these changes is identifiable. 15% of the farmsteads were located within a radius of 0.5km from the village centre (4% of the study area), from 0.5 to 1.5km (56% of the study area) – 48% and further than 1.5km (40 % of the study area) – 37%. At a distance below 0.5km, the highest percentage was constituted by seasonally-used farming enclosures (55%) and those in constant use (27%) (Fig. 1).

The newly-built buildings were also numerous (18%). However, no abandoned buildings, nor any remains of no-longer-existing farmsteads, were noted here. Within the distance radius of 0.5-1.5km, the largest percentage was accounted for by farming enclosures utilised periodically (42%), but at the same time, the percentage of abandoned farmsteads was also significant (19%) as well as that of farmsteads remains (17%). At a distance further than 1.5km, the abandoned farmsteads accounted for the largest percentage (36%). Many still-dwelled-in farming enclosures (21%) within this range were also identified.

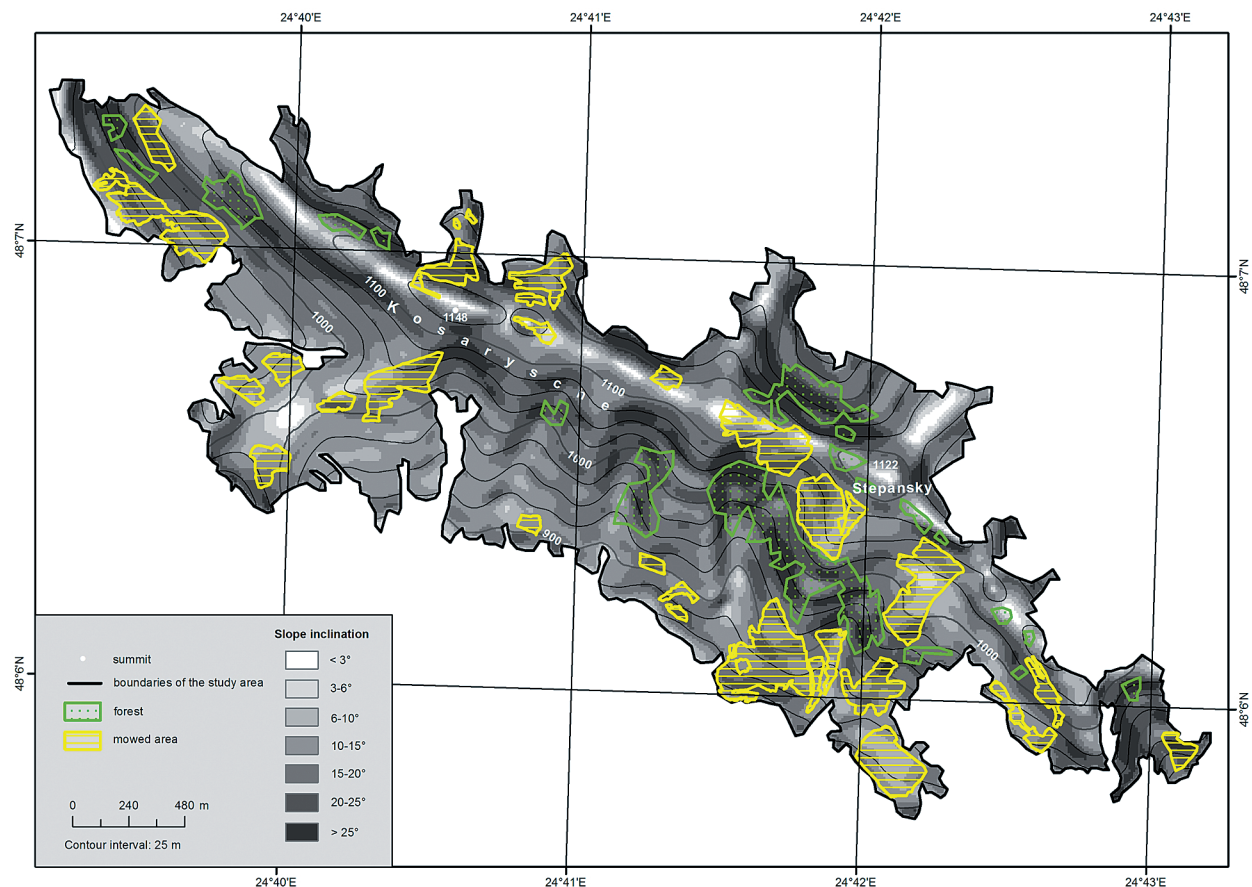
An analysis of administrative relations reveals that far fewer farmsteads (10) were situated on the

slopes descending towards the valley of Bystrets than on the slopes belonging to the village of Dzembronia (65). This is justified by the fact that only 18% of the research area was located on the side of Bystrets. However, the density of farming enclosures is similar – 0.10 buildings per ha for Bystrets and 0.15 in the case of Dzembronia. On the slopes descending to the Bystrets Valley the boundary of the forest runs at a higher level, which may as well be the reason why there is no new development in that area. Relatively large percentage (40%) of the Bystrets Valley being dominated by remains of non-existent farmsteads is related to less favourable conditions resulting from greater steepness and northeasterly aspect. Both sides of the ridge have a lot of farming enclosures of a seasonal use – in both cases, they amount to 40% (Fig. 2).

As a consequence of the depopulation of Kosarysche, the intensity of land use is reduced. The mowed areas totalled 75.4ha, which amounted to only 14% of the analysed area. 8% of the study

area was forested, while the rest (78%) comprised extensively used pastures and fallow lands. Arable land occurred sporadically and its area did not exceed that a few acres. They seemed to play a role of backyard vegetable gardens, whose produce was consumed on a regular basis. Orchards presented a similar situation and they consisted mostly of a few dwarfed fruit trees.

A total of 30 mowed areas were mapped ranging in size from 0.09 to 8.53ha, rendering an average of 2.51ha. The distribution of harvested areas and forest patches showed a direct correlation with the very lie of the land (Fig. 3). With regard to the high supply of harvestable land as measured in relation to its demand, it is possible to select areas presenting the most favourable conditions for harvesting. This is why mowed areas were usually located on the ridge and slopes within which the inclination values were lesser than 20°. Conversely, forest patches mostly occupied erosional forms and slopes of an inclination greater than 25°.



**Fig. 3.** Land use in the relation to slope inclination on Kosarysche Ridge (October 2010)

Source: Developed by the authors based on GoogleEarth, digital elevation model (DEM) and own research

## 5. Discussion

The transformations occurring today in the traditional settlement system and the land use pattern observable within the Hutsul region pertain also to the study area, as indicated by the results obtained. The cultural landscape of the Kosarysche Ridge is undergoing a significant transition, as evidenced by the changes in the location of farmsteads and their utility profile, as well as in the farming manner itself.

It has been established in the course of the study that the vast majority of abandoned farmsteads were located within the altitude range of 900–1,000m. This somewhat contradicts the assumption that the phenomenon of abandoning farmsteads is directly related to the height above sea level, or in other words, that dwellers tend to abandon upland farmsteads in the first instance. It turns out, however, that nowadays the highest parts of Kosarysche constitute an attractive location for second-time property owners looking for picturesque surroundings for their 'country homes', and, therefore, the abandoned buildings enjoy quite a popularity among the new eager buyers. And in fact, several buildings in the area have already been converted into dachas (4). Various properties located in lower lands are also being repurchased – they might seem abandoned, but they are actually a welcome choice for the new owners. Moreover, some abandoned cottages function as lodging facilities on-demand, providing accommodation for tourists (3). Also some inhabited buildings operate as agritourism farmsteads. These observations are consistent with the results of the study of Latocha (2012) conducted in the Sudetes. She also stated that parcels located at higher elevations are attractive for so called 'country homes'.

The reason for the mowing of such a small area of Kosarysche is the minimal number of animals in the particular farmsteads. Based on the interviews, it was found that, on average, the livestock comprises 6 cows. Sheep and pig husbandry takes place occasionally, but the farmsteads also often keep a horse or a goat. An average area necessary to maintain one bovine animal is 1.5–6ha (Gudowski, 2001). Assuming that the favourable climate and soil conditions determine the relatively high quality of the pastures of Kosarysche and that in all of

the farmsteads used either regularly or seasonally animal husbandry is practised, the livestock density is still far too low to cover the entire unforested grazing area.

Similar conclusions with regard to contemporary changes in the distribution and use of farmstead land were reached by Baumann et al. (2011), who examined the factors affecting the cessation of land cultivation in Western Ukraine, and Kuemmerle et al. (2008), upon conducting an analysis of the process of abandonment of farmsteads located on the Polish-Slovak-Ukrainian borderlands in the post-socialist period. Their findings evidenced the fact that an increased altitude in Ukraine is not positively correlated with the practice of abandonment of farmsteads, just as abandoning the farmsteads is not typical of scarcely populated areas. What has been shown, however, is the relation with the age demographics of the population – more depopulation occurs in areas where a higher proportion of the community is constituted by young people. This relationship is also confirmed by the research carried out in the region of Kosarysche. Attachment to the land, which typifies the older generation of locals, keeps them from leaving even the upland farmsteads.

An important phenomenon influencing indirectly the transformation in the settlement system and land development patterns are the changes in mentality of the inhabitants and their general preferences. It seems that the traditional distribution of households at some distance from one another has recently become obsolete. The newly constructed buildings are located close to each other, usually at the bottom of the valley, which is developed densely and rather chaotically. The traditional Hutsul architecture is receding into the background in favour of western standards. Fewer and fewer new buildings are being erected in the Hutsul style. In some cases it is even impossible to speak of a careful and thoughtful spatial planning with regard to skillful blending of the buildings into the landscape. Many dwellers do not appreciate the beauty of their native culture, allowing for the slow and painful dilapidation of the traditional wooden hut. The changes in farming strategies manifest themselves primarily in a general cessation of grazing and also in the displacement of traditional tools with more modern ones.



Similar observations were made by Latocha (2012) in the Sudetes as well as Steinicke and Löffler (2013) in the Italian Alps. Not only do they state that newly built houses are chaotic and have no reference to traditional architecture but also that the function of the villages has changed as dwellers are no longer employed in farming.

Consequential to the transformations observable in the farming style are the very changes noticeable in the natural environment. Cessation of mowing and grazing at a large area of the Kosarysche region results in a succession. The processes of reforestation, and thus the raising of the timberline, together with the overgrowing of mid-forest clearings are typically observed in Chornohora (Sitko, Troll, 2008), as well as in other parts of the Carpathians (Kozak, 2003; Kuemmerle et al., 2008). Currently, this process is relatively slow, but if the direction of the changes is to be maintained, then the timberline in this area is bound to continue to rise in the future.

## 6. Conclusions

The Kosarysche, like the entire Hutsul region, is currently undergoing some significant changes. The migration processes are clearly visible, resulting in population shifts towards village centres or cities. The main causes of the observed transition are: the high price of the land, the desire to improve the living conditions, better access to basic services and the overall 'westernisation' of life. Depopulation occurs in positive correlation with the increasing altitude and distance from the centre of the village. However, no clear relationship has been found between the administrative affiliation and the process of farmstead abandonment.

Attractively located buildings are purchased together with the land and converted into summer-time cottages. Distribution of the mowed areas correlates with the slopes with the smallest inclination. The unprofitability of cattle husbandry, i.e. the lack of collection centres for dairy products in connection with their low price is the cause of the reduction in the density of livestock and the running of production for own needs only. All of the above-described phenomena lead to a change in the

nature, appearance and zoning of the Hutsul village. In consequence of globalisation the traditional cultural landscape, so typical in this area even several years ago, has been undergoing a gradual transformation approximating it to that of a conventional rural landscape. A trend of uniformisation and standardisation of the cultural landscape can be noted here, with its intrinsic features fading into oblivion resulting in an objective loss of high aesthetic values.

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